

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

These amendments introduce no new matter and support for the amendment is replete throughout the specification and claims as originally filed. These amendments are made without prejudice and are not to be construed as abandonment of the previously claimed subject matter, or agreement with any objection or rejection of record.

**Listing of Claims:**

**Claims 1 to 18 (Cancelled).**

**19. (Currently amended)** A composition comprising a plurality of structurally ordered nanostructures comprising group III-V, group II-VI or group IV semiconductors or alloys, wherein ~~said members~~ nanostructures further comprise one or more alignment ligands associated with the nanostructures, and wherein a first alignment ligand on a first member nanostructure cross-links with a second alignment ligand on an adjacent member nanostructure, thereby structurally ordering the plurality of nanostructures in a polymerized matrix.

**20. (Original)** The composition of claim 19, wherein the structurally ordered nanostructures comprise substantially non-randomly oriented nanostructures.

**21. (Original)** The composition of claim 20, wherein the structurally ordered nanostructures comprise substantially aligned nanostructures.

**22. (Original)** The composition of claim 19, wherein the first and second alignment ligands comprise the same molecule.

**23. (Original)** The composition of claim 19, wherein the first and second alignment ligands comprise different molecules.

**24. (Original)** The composition of claim 19, wherein the first and second alignment ligands comprise self-organizing molecules.

**25. (Original)** The composition of claim **19**, wherein the first and second alignment ligands comprise complementary binding pairs.

**26. (Original)** The composition of claim **25**, wherein the complementary binding pairs comprise two or more molecules having a selected molecular recognition functionality.

**27. (Original)** The composition of claim **26**, wherein the first and second alignment ligands comprise an amine-containing moiety or an alcohol-containing moiety, or both.

**28. (Original)** The composition of claim **26**, wherein the first and second alignment ligands comprise one or more biomolecule pairs.

**29. (Original)** The composition of claim **28**, wherein the biomolecule pair comprises an antibody and an antigen that binds to the antibody; biotin and avidin; a lectin and a carbohydrate ligand; complementary nucleic acids; a protein and a ligand; a receptor and a ligand; an aptamer and an aptamer ligand; or a combination thereof.

**30. (Original)** The composition of claim **19**, wherein the first alignment ligand and/or the second alignment ligand comprise two or more selected molecular recognition functionalities per alignment ligand.

**31. (Previously presented)** The composition of claim **19**, wherein the nanostructures comprise spherical, ovoid, elongated or branched structures.

**32. (Original)** The composition of claim **31**, wherein the nanostructures comprise nanocrystals, nanospheres, nanorods, nanowires, nanotetrapods, dendrimer branching structures, or combinations thereof.

**33. (Previously presented)** The composition of claim **19**, wherein the cross-linking between the first and second alignment ligands comprises an ionic interaction, a covalent interaction, a hydrogen bond interaction, an electrostatic interaction, a coulombic interaction, a van der Waals force interaction, or a combination thereof.

**34. (Original)** The composition of claim 19, wherein the first and second alignment ligands comprise one or more functionalized head group capable of binding to a nanostructure surface or to a ligand associated with the nanostructure surface.

**35. (Original)** The composition of claim 34, wherein the functionalized head group comprises one or more phosphonic acid, carboxylic acid, amine, phosphine, phosphine oxide, carbamate, urea, pyridine, isocyanate, amide, nitro, pyrimidine, imidazole, salen, dithiolene, catechol, N,O-chelate ligand, P,N-chelate ligand, or thiol moieties.

**36. (Original)** The composition of claim 34, wherein the chelate N,O ligand comprises ethanol amine or aniline phosphinate.

**37. (Currently amended)** A plurality of clusters of structurally ordered nanostructures dispersed in a matrix on a surface of a substrate, wherein long axes of the nanostructures are aligned substantially parallel to the substrate surface and wherein the matrix comprises alignment ligands cross-linking and orienting the nanostructures.

**38. (Original)** The plurality of nanostructure clusters of claim 37, wherein the structurally ordered nanostructures comprise selectively-oriented nanostructures.

**39. (Previously presented)** The plurality of nanostructure clusters of claim 38, wherein an orientation of the selectively-oriented nanostructures is substantially aligned with a selected axis.

**40 - 41 (Cancelled)**

**42. (Original)** The plurality of nanostructure clusters of claim 37, wherein the nanostructures comprise nanorods or nanowires.

**43-67. (Cancelled)**

**68. (Cancelled)**